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A STUDY OF METHODS OF CONTROLLING IMPULSES.

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DESCRIPTORS- *SELF CONTROL, *ACADEMIC ACHIEVEMENT, STATISTICAL ANALYSIS, REFERENCE MATERIALS, TABLES (DATA), *BEHAVIOR PATTERNS, LISTENING SKILLS, SPONTANEOUS BEHAVIOR, CALIFORNIA TEST OF MENTAL MATURITY, ABILENE, SEQUENTIAL TEST OF EDUCATIONAL PROGRESS, REGRESSION ANALYSIS, HUMAN TALENT RESEARCH PROGRAM, UNIVERSITY OF TEXAS, CORRELATIONS

THE PERSON LESS ABLE TO CONTROL HIS IMPULSES IS ALSO APT TO EXHIBIT SOCIALLY DISVALUED BEHAVIOR. VOCATIONAL AND ACADEMIC FAILURE IS A PARTIAL CONSEQUENCE OF IMPULSIVENESS AND LACK OF SELF-CONTROL. TO INVESTIGATE IMPULSE CONTROL, TWO INSTRUMENTS BELIEVED TO MEASURE ATTRIBUTES OF OPPOSITE POLES OF THIS CONCEPT (SEQUENTIAL TESTS OF EDUCATIONAL PROGRESS (STEP) LISTENING AND A PEER NOMINATION ITEM FOR IMPULSE CONTROL) WERE CORRELATED WITH SEVERAL OTHER PERSONALITY, COGNITIVE, AND SOCIOMETRIC MEASURES. FROM THE DATA POOL OF THE UNIVERSITY OF TEXAS "HUMAN TALENT RESEARCH PROGRAM," MEASURES OF APPROXIMATELY 1,000 SEVENTH-GRADE STUDENTS WERE USED. AN APPLIED, MULTIPLE LINEAR REGRESSION PROCEDURE TESTED THE INTERACTION BETWEEN IMPULSE CONTROL AND COGNITIVE, PERSONALITY, AND SOCIOMETRIC VARIABLES AS A PARTIAL EXPLANATION OF ACADEMIC ACHIEVEMENT. REGRESSION EQUATIONS WERE ALSO COMPUTED TO TEST THE CONTRIBUTION OF THE IMPULSIVITY MEASURES TO CERTAIN ACADEMIC CRITERIA IN THE PRESENCE OF OTHER INDEPENDENT VARIABLES. STEP LISTENING PARTIALLY MEASURED IMPULSE CONTROL, WHILE THE PEER NOMINATION ITEM MEASURED POSITIVE ATTITUDES TOWARDS OTHERS. INTERACTION BETWEEN THE SUPPOSED IMPULSE CONTROL MEASURES AND OTHER PERSONAL CHARACTERISTICS WAS NOT CONSISTENT. IMPULSE CONTROL SHOULD BE STUDIED USING INDIVIDUAL CASE STUDIES RATHER THAN GROUPS. (PS)

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I. INTRODUCTION

The ability to delay action until one has had time to make a judgment of the possible consequences of that action appears to be an important dimension of human behavior (Freud, 1960; Parsons and Shils, 1951; Rapaport, 1951). This ability may be termed impulse control as opposed to impulsivity or to lack of self-control. In the Freudian framework of personality, impulsivity can be thought of as Id processes. Such processes are frequently observed during infancy and are characterized by the inability, seemingly, to tolerate a delay in gratification. The infant wants to be satisfied whenever he feels a need; he thrives in a state of hedonism; he is thoroughly self-centered.

With the process of socialization, the youngster is expected to learn to place some limitations upon his "impulses to pleasure." Whenever and wherever the culture dictates, those pleasures are to be controlled in identifiable ways. Again in Freudian terminology, the reality controls of the Ego are expected to develop. For example, the toddler is expected to learn that he cannot freely give way to his impulses to eliminate body wastes whenever and wherever he pleases, as the infant may. Instead, there is a place and often another time when such body functions are to be allowed to operate and, thus, physiological "pleasure" or "satisfaction" to be permitted to occur. Or, the teenager living within an adult body and in a sexually stimulating culture, is still often expected to forego the pleasures of specified sexual behaviors and instead to control those impulses until a time and circumstance sanctioned by social and/or religious beliefs and values.

No connotation of goodness or badness is herein placed on impulse behavior as a class. Society often condones impulsive behavior within prescribed limits. Instead of spontaneously and impulsively obeying a need as it arises, however, a person should have the ability to delay long enough to consider the consequences of his behavior. His decision may be to go ahead with the desired behavior or to delay still further--indefinitely perhaps.

General Problem

Why be concerned about whether or not an individual is self-disciplined? Simply because the efficiency and productivity of an individual or a group, as well as the "happiness" of the same individual or group, requires it. At this point the present writer believes that a partial "about face" needs to be made by those who seem to make a blanket indictment of conformity behavior which is the polar opposite, to some extent, of impulsivity. True it is that conformity can be and is carried to extremes and very definitely may damage (or completely inhibit) the development of creativity or originality in problem-solution.

Nevertheless, as much as creative ability is needed in some situations, it is also true that conformity behavior is needed in other situations. Generally, one could say that "conformity" is needed when an old problem presents itself. As an example, in the medical profession if some malady exists which yet cries out for a cure, creativity of a kind is demanded in an attempt to find a remedy. But once a successful remedy is found, it would be illogical for any medical doctor with the knowledge of the solution--the cure--to fail to conform to the created solution and to continue searching independently in whatever original way at his disposal for his own solution to the problem. This situation calls for "conforming" behavior. The second doctor may continue to search for a cheaper or less distasteful cure, but then he has a <u>new</u> problem which needs a solution. Conformity behavior has its urgent place. (One might try nonchalantly driving through all the red traffic lights he sees if unconvinced.)

Apparently the person who is less able (or willing) to control his impulses to action is also the person who is more apt to exhibit socially disvalued behavior (Redl and Wineman, 1957; Glueck and Glueck, 1950; McCord and McCord, 1956). If he says exactly what he thinks at any given moment, he may create friction by disturbing other people through his language. If he sees an object

that is attractive and worthy of ownership to him, he may take it for himself regardless of who the rightful owner is. If he marries, he may be so wrapped up in selfish impulses that he cannot be made to feel much concern for his own wife and children. The individual who does a thing on the spur of the moment and lives to regret it may be so pummeled by feelings of guilt about his behavior that he develops some neurotic syndrome (Mowrer, 1964).

Or consider less serious examples. Instead of following regulations (procedures) in detail, an assembler on impulse decides it would be interesting to see what happens if he deviates from the plan. The result may be a damaged product. The English teacher may ask for a theme to be written in a given way; but the impulsive student can decide to do everything quickly--getting it done being the main thing. But the teacher assigns a low grade indicating his devaluation of the product.

Teacher evaluation of academic work is a criterion area that will be selectively important for the ensuing study. Whether or not the earning of high academic grades is "good" or not is irrelevent to the investigation. Nevertheless, the ability and the motivation to obtain "good grades" in school is a class of behavior that is valued by persons of power and/or influence in the current U.S. society. Administrative and academic personnel at each successively higher level of education are concerned with "potential" for success as evidenced by prior school achievement. At the secondary and higher education levels, prospective employers are concerned with the student's potential to be a successful employee as indicated by high school and college grades. In spite of attempts via the progressive education movement to de-emphasize school marks, their use as success indicators is still highly valued--especially above the elementary grades. It is the writer's judgment that one of the reasons for continuing interest in this area is that academic achievement is to some extent an indication of self-control.

Academic behavior has long been described (and decried) as conformity behavior. Apparently the student who is willing and able to defer his own impulses to action and submit his behavior to the expectation of a teacher will, generally speaking, be more apt to be rewarded by the teacher with a higher grade. The student who is more inclined to satisfy his own impulsive desires rather than the expectations of an authority figure, such as the teacher, may fail to do some of the academic work expected of him or fail to do it in the manner required and consequently receive a lower grade mark on being evaluated.

Assuming that impulse control is a major dimension of human behavior and assuming further that it is important to know about the level of this kind of control in a given person, the problem arises of how to assess this characteristic. If it is true that "a large proportion of academic and vocational failures have undoubtedly resulted from such personality attributes as impulsivity and lack of emotional control, concern only for the present, and inability to work for delayed gratification" (Davids and Sidman, 1962, p. 174), to be able to identify degrees of these qualities in youngsters would appear to be advantageous. This points up the first major problem of this investigation: how to measure impulse control. Two instruments will be studied for this purpose, one a psychometric, the other a sociometric. Paragraphs relative to the question of measuring impulse control will subsequently be referred to as Part A.

The second problem area of the study, Part B, is to determine how well knowledge of impulse control as measured by the selected indicators combines with measures of other variables in explaining one kind of behavior assumed to be highly related to control: academic achievement.

Related Literature

Several papers have appeared in the decade just past treating one or another aspect of the problem of

impulse control:

In a theoretical article, Singer (1955) attempted to relate the concepts of "delayed gratification" and "ego development" and made some suggestions for research within a psychoanalytic framework.

Wallace and Rabin (1960) attempted to integrate the ideas of Rapaport and others on the possibility of personality variables (also maturation) being related to time perspectives. They suggest that temperamentally different people differ in their readiness to act upon an idea or impulse, or in their tendency to delay or to postpone.

Two studies of schizophrenic veterans yielded some support for a suggested hypothesis that there is a personality dimension which involves a linkage of fantasy tendencies with control of motility and impulsive behavior (Singer, Willensky, and McGraves, 1956; Levine, Glass and Meltzoll, 1957). In both papers, the point was made that persons who tend to see numerous figures in movement on Rorschach inkblot cards, tend to be inhibited in their own motor activity.

An Israeli study by Siegman (1961) comparing youthful clinical offenders and "nondelinquents" found the former to have significantly lower time perspective scores. There were no sizeable group differences with regard to their scores on a motor impulse inhibition task.

Studying Trinidadian Negro youngsters (ages 12 to 14), Mischel noted that the more socially responsible youths had a greater tendency to prefer delayed, large reinforcements over smaller, immediate reinforcements (1961). He also discovered a positive relationship between preference for delayed reinforcement and the need to achieve.

Using speed of response and number of errors on a visual-matching task as a measure of impulsiveness,

Kagan (1965) related errors in reading English words by first and second graders to impulsivity.

Roos and Albers (1965a) reported a study indicating that alcoholism may be related to impulsivity. Their findings support the notion that alcoholics are more concerned with immediate gratification of impulses than they are with appropiate handling of long-range goals. The same authors reported similar findings for mental retardates (1965b).

Two hundred sex offenders at Sing Sing prison were studied over a five-year period. One of the four primary factors judged to be operating in adding to the problems of the prisoners was that they lacked adequate control of impulses (Hammer and Glueck, 1957).

The presence of family difficulties was found by Wagner (1960) to be significantly related to the development of low impulse control in children. Wagner's paper stresses the developmental aspect of self-control.

A dissertation by Verrill (1958) suggests that characteristics of quickness and inappropriateness of verbal response differentiates impulsive from controlled persons at the college level. The more highly controlled individuals were described as being more sensitive to the feelings and expectations of others.

An article by Davids and Sidman (196?) is relevant to the present study. Comparing ten academically successful "future scientist" students with twenty "underachievers," the latter were found to be more impulsive and less able to control and inhibit their responses and less able to delay gratification of their needs. Measures were used of motor inhibition, time orientation and estimation, and fantasied delay of gratification.

A rather large variety of instruments have been utilized in attempts to measure this seemingly important aspect of personality: psychomotor task performance (Anderson, 1962; Tumarkin, 1963; Kelly and Veldman,

1964); sentence or story completion techniques (Jonns, 1963; Laffey, 1963); case history rating for impulsive behaviors (Tallent, 1958; Wagner 1960; Quay, 1964); self-report scales (Sanford, Webster, and Freedman, 1957; Sutton-Smith and Rosenberg, 1959; Barratt, 1959; Hirshfield, 1965).

Theoretical Background

Following McGuire (1961, 1963), Goethals (1958), and Guilford (1959), human behavior of many kinds may be considered to be a function of several forces operating within and external to the behaver. As a model:

$$\text{Behavior} = f\left[CV(P,E,R),S,C\right]$$

where, P = abilities of the individual pertinent to the behavior;
E = expectations in the form of motivations or attitudes which may block or encourage action toward specific goals;
R = responses in the form of frustration tolerance or the ability to cope with the impositions and the expectations of others (both peers and adults);
S = sex-role;
C = cultural context;
and, CV = a moderator dimension representing some factor in persons postulated to interact with and thus to modify the effects of, the abilities, expectations, and responses of a person. Presumably, different moderators may be relevant to different behaviors. The moderator of interest in this study may be defined by the bi-polar concepts of "Impulsivity vs. Impulse-Control." The impulse control pole may be described theoretically as: ability to delay impulse gratifications or concern for the future and the consequences of present action as opposed to immediate need gratification.

The present study proposes to take a closer look at the interaction implied by CV(P), CV(E), and CV(R) in the above pseudomathematical model and to relate the results to McGuire's theoretical framework of human behavior. This theoretical model implies that the presence of some element of personality (in this case the ability to control impulses, CV) interacts in some functional way with other aspects of personality (abilities, P; motivations, E; expectations, R) in order to partially account for, or explain, behavior. The related literature definitely suggests that impulse control is an important dimension of human behavior; part of the present task is to determine if that dimension also acts as a moderator of other personal qualities. The method utilized to test this possibility follows.

II. METHOD

Subjects

In the school year 1957-58 the total seventh grade population of four Texas communities responded to a large battery of tests as a part of the Human Talent Research Project[1] (HTRP) of The University of Texas and the U.S. Office of Education. Over 1,500 youngsters were tested in that school year, and they were retested each of the following five years through 1962-63. From the wealth of material existing in the HTRP data pool was drawn the information required for this study. Several hundred students were lost to the project by the end of grade 12 because of drop-outs and geographic mobility. Consequently, the N varies greatly between analyses using only seventh grade data and analyses using twelth grade data as well. The wide range of variables included cognitive, personality, and sociometric instruments, each assumed to measure some important aspect of a person.

Measuring Instruments

Two measures were selected as possible indicators of the concept of central concern in this project, impulse control. They were: (1) the Listening subtest of the Sequential Tests of Educational Progress (STEP), and (2) a peer nomination item for impulsivity.

Because STEP Listening was found to be significantly related to juvenile delinquency (Kelly, 1963) and highly related to academic achievement (Whiteside and Murphy, 1963) in previous HTRP studies, the possibility of this instrument occupying a unique and perhaps unintended importance in educational measurement has been pondered by the present writer for some time. The validity of STEP Listening as a test of "listening ability" has been questioned (Anderson and Baldauf, 1963). However, there are some requirements involved in responding

[1]Directed by Professor Carson McGuire.

to this instrument that suggest that the test may measure control of some sort to an important extent. A person responds to this instrument first by listening to the reading of a descriptive paragraph and secondly, by listening to oral questions and then marking one of a series of written responses as the correct answer. To be relatively successful in making correct responses, one must be able to "attend to" what the reader is saying and to shut out irrelevant environmental attractions and internal impulses to do something else (Kelly, 1963, refers to this quality as the ability to maintain a convergent set). Not only is the high scorer on STEP Listening required to "know" something, he needs to be able to pay close attention and keep himself oriented to the task. There is no retracking in order to re-read an oral passage. Thus, the ability to control oneself seems quite relevant to the task of responding to this instrument of presumed "listening" ability. A high score on STEP Listening was assumed to indicate high impulse control.

The peer nomination item for impulsivity, "Name three persons about your age who do many things without thinking. They 'don'tcare' but sometimes they are sorry," was developed with the assumption that an observer could appropriately perceive degrees of controlled and non-controlled types of behavior and could distinguish one individual as being more or less controlled when compared with others. So that high scores would reflect a high level of control, the scale was reversed and will hereafter be identified as Nomination: Impulse Control.

A plus characteristic for either of these two measures is that biased answers will not be given by the person receiving the score. In the first instance, with STEP Listening the subject is simply not aware that the investigator is interested in impulsiveness, and in the second case, the subject's score is determined by other people. (This is not to suggest that the others may not be biased in some way from their own accord.)

Additional instruments were selected to represent

some characteristic of a person thought to be relevant to many kinds of behavior as described in McGuire's social theory above. Because they obtained relatively high loadings on presumably independent and theoretically relevant factors in various factor analyses of the HTRP seventh grade data (McGuire, 1960, Tables G-5 and G-9), the following variables were selected as possibly useful indicators of the different aspects of theory:

Theoretical Category		Postulated Measure
Convergent Thinking	- - -	California Test of Mental Maturity
	- -	STEP Listening
Divergent Thinking	- - -	Seeing Problems
	- -	Consequences
	- -	Common Situations
Symbol Aptitude	- - -	Short Words
	- -	Rhymes
	- -	Mutilated Words
Underlying Motivations	- - -	CMAS: Anxiety
	- -	CYS: Personal Maladjustment
	- -	JPQ: Emotional Instability
Expressed Attitudes	- - -	SSHA: Scholastic Motivation
	- -	JPQ: Socialized Morale
	- -	CYS: Criticism of Education
Peer Expectations	- - -	Peer Nomination: Party With
	- -	Peer Nomination: Negative Behavior Model
	- -	Peer Nomination: Academic Model

Adult Expectations - - - Index of Social Status (ISS)

(See Appendix A for a brief description and Appendix B for descriptive statistics on each of the instruments.) It will be noted that perhaps the weakest point in the selection of variables is in the Adult Expectations category.

Technique of Analysis

Part A. STEP Listening and the nomination item were first subjected to a separate analysis in order to confirm or disconfirm the hypothesis that each might be considered to be a measure of impulse control. Since the ability to control one's behavior appears to be of consequence in terms of fitting into society and since to get along with others means to be able to relinquish one's own here-and-now preferences for action, then a measure of impulse control ought to correlate positively with socially approved qualities of a person's behavior. For example, since emotional instability is a generally disapproved quality, a measure of emotional instability should correlate negatively with some measure of impulse control.

In order to test the above hypothesis, both STEP Listening and the peer nomination item were correlated with the other cognitive, personality, and social measures named above. Both of the impulse control instruments were adjusted in some way before making the correlations. The nomination item scores were stanined in order to more nearly approximate a normal distribution, while STEP Listening was correlated with each other variable with the effects of intelligence as measured by the California Test of Mental Maturity (CTMM) partialed out because there was a relatively high positive relationship existing between STEP Listening and CTMM, R = .50. A statistically significant correlation was to be adjudged as supporting the hypothesis if the sign of the coefficient was consistent with the theory of social approbation of self controlled individuals.

Part B. Academic achievement or any other sample of behavior can, when considered from the viewpoint of the psychological theory described above, be expressed mathematically in terms of a multiple linear regression equation:

$$(I)\quad Y = A_0 + A_1X_1 + A_2X_2 + \ldots + A_nX_n,$$

where, Y = the criterion (such as high school grade point average, GPA),

$X_1, X_2, \ldots X_n$ = independent variables,

and, $A_0, A_1, \ldots A_n$ = regression weights (or constants).

A "least squares" procedure is typically used to compute the constants in such a way that errors of prediction are minimized. It is possible that the effect of a given prediction variable in a regression model might vary as a function of another independent variable, so that if these two variables could be functionally related the efficiency of prediction might be further enhanced. This is known as the "moderator variable" effect as described by Saunders (1956), or an "interaction effect" in the terminology of Bottenberg and Ward (1963). (See Saunders for a graphic illustration of this effect.) Hereafter, the terms moderated effect and interaction effect will be used interchangeably.

One type of functional relationship between independent variables may be tested by the use of a product term in a prediction system:

$$(II)\quad Y = A_C + A_1X_1 + A_2X_2 + A_3X_3$$

where X_3 = the direct product of scores on the two variables X_1 and X_2 for any one subject, and the other terms are defined as above.

In order to determine whether or not the moderator

variable effect is contributing significantly to the criterion variance above and beyond the effect of the two independent variables involved in a routine linear sense, the multiple correlation of the moderated model (II) was compared with the multiple correlation of the non-moderated model:

(III) $Y = A_o + A_1X_1 + A_2X_2$, where all terms have been defined.

The decrease in the multiple R from equation II to equation III was tested with the F-ratio:

$$F = \frac{(R^2_f - R^2_r)/ DF_1}{(1 - R^2_f)/ DF_2},$$

where, R^2_f = R-square for the full model (II),

R^2_r = R-square for the restricted model (III),

DF_1 = degrees of freedom for the numerator; the number of unknown weights in the full model minus the number of unknown weights in the restricted model,

DF_2 = degrees of freedom for the denominator; the number of subjects minus the number of unknown weights in the full model.

(Guilford, 1956, p. 400; Bottenberg and Ward, 1963, Appendix I.)

A series of moderated (full-model) regressions were run against seventh grade GPA as the criterion and with STEP Listening as the assumed moderator variable and again with the nomination item as moderator. The variables thought to have a functional relationship with the impulse control measures and GPA achievement were the same as those named for Part A, representing the P, E, and R of the psychological model. If a significant

difference were to appear between mathematical models II and III for any given personal characteristic variable interacting with an impulse control measure, then it could be assumed that a functional relationship between the characteristic and impulse control existed in support of theory.

Of next concern was whether or not the interactions that did show up as significant would remain so when placed within a full-blown predictor system with all aspects of McGuire's theory of behavior represented. An earlier report of The University of Texas (Whiteside and Murphy, 1963), using the same variable pool had utilized a step-wise regression procedure (Shultz and Goggans, 1961) in order to select the best predictor available per category of theory in conjunction with measures of each of the other categories.

They were:

Theoretical Category	Variable
Convergent Thinking	STEP Listening
Divergent Thinking	Seeing Problems
Symbol Aptitude	Mutilated Words
Underlying Motivation	CMAS Anxiety
Expressed Motivation	JPQ 8: Socialized Morale
Peer Expectation	Nom: Academic Model
Adult Expectation	Index of Social Status (ISS)

Since STEP Listening has a different principle role in this study, it was replaced by CTMM and the resulting seven variables considered to be a basic mathematical model. Moderated models were developed from the significant interactions appearing in the tests for interaction. This simply meant that the impulse control variable and its product with a second variable were added to the seven basic predictors. The multiple correlation of that model was then compared with a model minus the product variable to see if what appeared to be an interaction effect retained its significance in the full model situation.

III. RESULTS

Part A

Tables 1 and 2 show the results of the correlation analysis for Part A. The second column of information indicates the anticipated direction of the correlation based on the brief rationale above. In Table 1 the three columns of correlation coefficients show: each instrument's correlation with STEP Listening, each's correlation with CTMM, and each's partial correlation with STEP Listening with the effect of CTMM removed. In every case the sign of the correlation was in the direction expected. However, one variable, Nom: Negative Behavior Model, failed to manifest a significant correlation with the impulse control measure at $p < .05$.

In Table 2 appear simple Pearson product moment coefficients. None of the Mental Function variables were significantly related to the nomination item for impulse-control. On the other hand significant correlations, correctly signed, occurred with five of the six personality and motivation variables. Only one of the social measures was related as expected, and its correlation was exceptionally high.

Part B

Table 3 gives the results of tests for interaction using seventh grade GPA as the criterion. For STEP Listening, only one variable showed a significant moderation effect--Nom: Party With. For the nomination item for Impulse Control there were three significant interactions with Emotional Instability, Socialized Morale, and another nomination item, Negative Behavior Model.

The tests for interaction were replicated with high school GPA as the criterion to determine if they were stable over time. The results indicate that none of the interactions seen in Table 3 remain significant (Table 4), and that two different interactions appear to be

MEASURING INSTRUMENT N = 1056	Hypothesized Direction of Correlation	Correlation With STEP Listening	Correlation With CTMM	Correlation With STEP L With CTMM Partialed out	Significance Level of Partial r
MENTAL FUNCTIONING					
Seeing Problems	pos.	.35	.39	.20	.01
Consequences	pos.	.31	.35	.17	.01
Common Situations	pos.	.25	.29	.13	.01
Short Words	pos.	.25	.32	.11	.01
Rhymes	pos.	.42	.56	.19	.01
Mutilated Words	pos.	.26	.39	.08	.05
PERSONALITY & MOTIVATION					
CMAS: Anxiety	neg.	-.17	-.19	-.10	.01
Personal Maladjustment	neg.	-.14	-.14	-.07	.05
Emotional Instability	neg.	-.24	-.26	-.13	.01
Scholastic Motivation	pos.	.33	.28	.24	.01
Socialized Morale	pos.	.06	.01	.07	.05
Criticism of Education	neg.	-.21	-.21	-.13	.01
SOCIAL MEASURES					
Index of Social Status	#neg.	-.38	-.45	-.20	.01
Nom: Party With	pos.	.18	.20	.09	.01
Nom: Neg. Behavior Model	neg.	-.03	-.04	-.01	n.s.
Nom: Academic Model	pos.	.26	.25	.16	.01

(#Conceptually, the hypothesized direction for ISS would be positive, but low scores mean high status.)

TABLE 1: STEP Listening and CTMM correlations with mental, personality, and social variables, and partial correlations of each variable and STEP Listening with the effect of CTMM partialed out.

MEASURING INSTRUMENT N = 1056	Hypothesized Direction of Correlation	Correlation With Nom: Impulse Control	Significance Level of Correlation
MENTAL FUNCTIONING			
Seeing Problems	pos.	.02	n.s.
Consequences	pos.	-.03	n.s.
Common Situations	pos.	-.02	n.s.
Short Words	pos.	.03	n.s.
Rhymes	pos.	.01	n.s.
Mutilated Words	pos.	.04	n.s.
PERSONALITY & MOTIVATION			
CMAS: Anxiety	neg.	-.03	n.s.
Personal Maladjustment	neg.	-.11	.01
Emotional Instability	neg.	-.07	.05
Scholastic Motivation	pos.	.18	.01
Socialized Morale	pos.	.10	.01
Criticism of Education	neg.	-.09	.01
SOCIAL MEASURES			
Index of Social Status	#neg.	-.04	n.s.
Nom: Party With	pos.	-.05	n.s.
Nom: Neg. Behavior Model	neg.	-.51	.001
Nom: Academic Model	pos.	.01	n.s.

(#Conceptually, the hypothesized direction for ISS would be positive, but low scores stand for high status.)

TABLE 2: Peer Nom: Impulse Control correlations with mental, personality, and social variables.

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.5506	.5505	.098	.5135	.5133	.323
Seeing Problems	.5139	.5126	1.975	.4164	.4133	3.310
Consequences	.4853	.4846	.917	.3482	.3481	.098
Common Situations	.4811	.4791	1.820	.3134	.3127	.502
Short Words	.5136	.5121	2.233	.3778	.3745	2.977
Rhymes	.5625	.5625	.005	.5172	.5168	.626
Mutilated Words	.5412	.5409	.466	.4260	.4260	.102
CMAS: Anxiety	.4776	.4770	.789	.2762	.2728	2.132
Personal Maladjustment	.4808	.4792	2.032	.2571	.2551	1.145
Emotional Instability	.5028	.5024	.648	.3504	.3457	3.919*
Scholastic Motivation	.5760	.5758	.470	.4927	.4909	2.465
Socialized Morale	.4810	.4806	.600	.2436	.2357	4.205*
Criticism of Education	.4932	.4926	.826	.3146	.3141	.338
Index of Social Status	.4669	.4663	.681	.3094	.3078	1.004
Nom: Party With	.5216	.5144	10.764**	.3672	.3653	1.671
Nom: Neg. Beh. Model	.4776	.4763	1.662	.1950	.1847	4.276*
Nom: Academic Model	.5652	.5640	2.055	.4674	.4674	.004

** = $p < .01$
* = $p < .05$

Table 3: F-tests for significance of interaction with seventh grade GPA as criterion (All Communities; N=1056)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C, and Variable	F
CTMM	.5949	.5940	.942	.5250	.5249	.069
Seeing Problems	.5494	.5473	1.901	.3921	.3918	.132
Consequences	.5046	.5046	.000	.3058	.3051	.265
Common Situations	.4968	.4952	1.180	.2553	.2535	.565
Short Words	.5487	.5487	.016	.3851	.3841	.495
Rhymes	.5741	.5741	.000	.4863	.4863	.012
Mutilated Words	.5539	.5495	3.959*	.4034	.3991	2.396
CMAS: Anxiety	.4917	.4914	.210	.2290	.2175	3.043
Personal Maladjustment	.4880	.4879	.053	.1831	.1824	.130
Emotional Instability	.5013	.5013	.039	.2798	.2778	.691
Scholastic Motivation	.5510	.5499	.974	.4139	.4053	4.781*
Socialized Morale	.4942	.4931	.821	.2085	.1994	2.194
Criticism of Education	.5138	.5126	.900	.2924	.2911	.462
Index of Social Status	.2655	.2644	.717	.1092	.1091	.067
Nom: Party With	.5027	.5027	.073	.2824	.2816	.265
Nom: Neg. Beh. Model	.4831	.4822	.635	.1662	.1588	1.382
Nom: Academic Model	.5840	.5816	2.296	.4736	.4704	2.159

** = p < .01
* = p < .05

Table 4: F-tests for significance of interaction with high school GPA as criterion (All Communities; N = 565)

significant.

Next, since it was then thought that community differences might have been masking each other, the same interaction tests were recomputed for each of the four communities using first the seventh grade GPA and then high school GPA as the criterion. Suffice it here to state that the results appeared random with no particular pattern appearing to support the interaction idea as expressed in the pseudomathematical model using the given assumed measures of impulse control. (See Appendix C for the detailed tables.)

Even though the results of the interaction effects were not encouraging, analyses continued through checking whether or not the significant moderator effects which had occurred would remain significant in a full-blown multiple regression relationship. Table 5 shows only those variables which appeared to be significant in the separate community analyses shown in Appendix C. About half of them <u>did</u> retain a significant relationship to the criterion in the presence of several other independent variables when using either the seventh or the twelth grade criterion. However, even in the instances of statistically significant moderator effects, the contributing increases in the multiple R's appear quite small.

MODERATED VARIABLE	Community A R_f	Community A R_r	Community B R_f	Community B R_r	Community C R_f	Community C R_r	Community D R_f	Community D R_r	All Comms. R_f	All Comms. R_r
SEVENTH GRADE GPA CRITERION; STEP LISTENING AS MODERATOR										
CTMM					.715*	.708				
Socialized Morale							.677^{ns}	.676		
Index of Social Status					.711^{ns}	.708				
Nom: Academic Model	.820**	.817								
SEVENTH GRADE GPA CRITERION; NOM: IMPULSE CONTROL AS MODERATOR										
Seeing Problems	.804**	.795								
Mutilated Words	.807**	.795					.712^{ns}	.711		
CMAS: Anxiety	.795^{ns}	.795								
Socialized Morale			.642*	.624						
							.664^{ns}	.663		
HIGH SCHOOL GPA AS CRITERION; STEP LISTENING AS MODERATOR										
CTMM					.776**	.759				
Mutilated Words	.817^{ns}	.813			.778**	.759				
CMAS: Anxiety					.765^{ns}	.759	.680^{ns}	.679		
HIGH SCHOOL GPA AS CRITERION; NOM: IMPULSE CONTROL AS MODERATOR										
Mutilated Words			.702**	.669						
CMAS: Anxiety	.755^{ns}	.752								

(Level of significance of difference between moderated (R_f) and non-moderated models is indicated by: ** = $p < .01$ and * = $p < .05$)

TABLE 5: Differences Between Multiple R's of Regression Models with Moderator Variable Effect and Models Without Moderator Variable Effect

IV. DISCUSSION

The results of Part A seem to confirm the possibility that STEP Listening may be measuring impulse control over and above the effect of intelligence. However, the evidence for the nomination item for impulse control breaks down. No correlation exists with the mental function measures. There appears to be a clue among the social measures as to what the nomination item is measuring to a large extent--a negative evaluation of another person. (The correlation between Nom: Impulse Control and Nom: Negative Behavior Model is -.51.) This, of course, fits with the conjecture that self-controlled persons are more highly valued socially. It could be that STEP Listening is more nearly an indicator of self-control in a cognitive sense, while the nomination item may be tapping some aspect of self-control in an interpersonal sense.

A moderator or interaction effect, indicating that at different levels of a given personal characteristic that self-control may have different consequences, is not manifest in any consistent sense at all. Since one can expect to find five chance significant results out of every hundred significance tests at the $p<.05$ level, many of the few significant F-ratios may be considered as simply chance or random results. If for any one variable, the moderator or interaction effect with STEP Listening or Nom: Impulse Control were a real one, the effect should be consistent from one community to another. No such evidence appears.

At the same time it should be recognized that such effects might still be occurring in the real world but that the evidence fails because of relatively low reliability (and even validity) of many of the measuring instruments involved. Many investigators would also state that trying to check such interactions against a GPA criterion might be doomed simply because of difficulties inherent in such a criterion. However, an earlier study of this same HTRP population using ninth grade data in-

dicated on cross-validations high degree of predictability of high school GPA if certain potent predictors were used. One will notice multiple R's as high as .80 appearing for some of the models in the present study. Multiple R's of this magnitude are thought to be very high in problems relating to academic achievement. However, the intention of finding consistent evidence for a moderator variable effect that might raise the correlation even higher has failed in any practical sense. This is not to state that the quality of self-control in an individual is not functionally related to other personal characteristics in influencing different kinds of behavior requiring control. It simply indicates that the particular instruments used in this study do not permit making a general statement of this idea. Several interactions did significantly increase the predictive efficiency of the full-blown GPA predictor model; they were just not consistent enough to permit the conclusion that any given one of the interactions exists as a general rule in affecting the teacher evaluated academic achievement of public school students.

When considering the attempt at identifying an area of interaction between impulse control and some other personal characteristic that would have a modifying [CV(P,E,R)] effect on behavior, an enigma remains from the present study for the most part. From Table 5, if only those interactions are considered which were significant at the $p < .01$ level in the full predictor models, it is observed that in only one case is the moderated variable not a measure of mental function. (The exception is Nom: Academic Model in Community A.) If only the problems involving high school GPA as the criterion are considered, the exception is eliminated. This way of "leaning over backward" to make an evaluation suggests that there might be some stability in the influence of self-control on mental functioning. Yet, one has only to view all the interaction tests from other tables involving mental functioning which did not significantly add to the predictability of teacher evaluated school achievement to realize that the present investigation as a whole fails to yield consistent support for the moderator effect of impulse control hypothesis.

V. CONCLUSIONS AND IMPLICATIONS

One attempt of the present study has been an effort to confirm the hypothesis that STEP Listening and a peer nomination item for Impulse Control were indicators of self-control. Self-control was considered to be a socially approved quality in persons that had something to do with whether or not an individual would respond quickly in terms of self-desire in a given situation or whether he might delay gratification of impulse long enough to consider the positive or negative consequences of his actions.

From this study what can be said about how a person controls his impulses? The pattern of correlations that have appeared with the hypothesized impulse control measures suggest first that the more intelligent person, generally speaking, is a more controlled person. He apparently has the ability to perceive more accurately and remember more distinctly what happens to oneself or others in a given situation. Consequently, if a situation arises in which he would like to gratify a felt need right away, his memory and his ability to relate one clue to another probably serve him to allow him to circumvent negative consequences if he so wishes. On the other hand, the less intelligent person simply does not relate his perceptual clues so well either to each other, to his memory, or to future possibilities.

One may also conclude from the peer nomination for impulse control correlations that whether or not a person is described as self-controlled is influenced by other persons' positive or negative evaluation of him. Consequently, an individual may be described by others as impulsive whereas he is actually a very controlled person. If he is unliked, a negative halo effect may operate to cause others to assign any number of negative qualities to him. Such a situation would reduce the usefulness of a peer nomination item intended as a measure of impulse control in a theoretical sense.

One could surmise that another confounding factor

in a study of impulse control might be that in some situations a given person might behave in a highly controlled manner, while such might not be true in an entirely different situation. So long as highly valued or powerful persons who expect self-control are in the sphere of influence, one is probably more controlled. When those valued or powerful persons in a given situation do not expect delay of need gratification, one is probably less inhibited. From such a situation the implication may be made that an individual should not be classified as either controlled or not controlled. Rather, whether or not he seeks gratification of particular impulses immediately depends to a great extent on the social environment of the moment. Life examples make this obvious: a youngster may sock another child when the two are by themselves or perhaps with other children when he wouldn't dare do so if certain valued and powerful adults were present. Or, a couple might indulge in sexual behavior in a parked car who again would not even consider the possibility in reality if certain valued and powerful persons who disapproved of such behavior were also present.

Such considerations point back to a theoretical framework in which situational variables as well as personal variables should both be taken into account in order to explain a given behavior (as in Murray's need-press system, 1962). McGuire's theory includes situational variables, but the measurement instruments are somewhat weak. Also, there was available no measure of the all-important influence of teachers-upon-students (important in view of the criterion, GPA achievement).

The concept of impulse control might be more usefully considered to be a basic personality dimension rather than functionally related to other variables in McGuire's theory. That is, it might be more useful to forget the "moderator" or "interaction" effect idea, and simply include a measure of impulse control as a separate independent variable in multiple linear regression systems. Evidence for this is seen in that where significant interactions were manifest in this study,

for all practical purposes the increase in relationship accounted for by the interaction effect was very little.

Frankly, the present writer would suggest that studies which attempt to explain any type of behavior should somehow consider the effect of the anticipated immediate and future social pressures. He would further suggest that in order to determine what influences lead to a given behavior that studies should focus on the individual. This would mean clinical case investigation rather than the group type investigation represented here. Therefore, this writer would recommend more support for case-type studies which, unfortunately, carry an unscientific aura.

A rash of mass murders in the summer of 1966 during which time this report was being written again emphasizes the damage that can occur when individuals fail to control themselves as expected by society. The suggestion is herewith made that the concept of impulse control continue to be a focus of study, but that investigations be studies in depth of individuals rather than large group studies in which individual differences become lost.

VI. SUMMARY

The ability to delay action until one has had time to make a judgment of the possible consequences of that action appears to be an important dimension of human behavior. Apparently, the person who is less able (or willing) to control his impulses to action is also the person who is more apt to exhibit socially disvalued behavior and, in many cases, fails to control himself to the extent that he may be separated from the rest of society by incarceration. In less extreme cases, he may fail to achieve academically, vocationally, or otherwise, as well as he might if he were a more self-controlled person.

The primary objective of this study was to investigate the concept of impulse control. Two instruments believed to be measures of the attributes of the opposite poles of this concept (STEP Listening and a peer nomination item for Impulse Control) were intercorrelated with several other personality cognitive and sociometric measures. From the structure of these intercorrelations and from certain hypothesized interactions of the variables, it was anticipated that a more definitive direction of research in this area might be indicated that would lead to some positive contribution to socialization theory. Such contribution would be expected to be relevant to such social problems as juvenile delinquency, neuroses, vocational and academic "underachievement".

A wealth of material exists in the data pool of the Human Talent Research Program (HTRP) of The University of Texas (supported by the U. S. Office of Education, 1957-64). From this data pool, measures of a large number of seventh grade subjects (over 1,000) from four Texas communities were utilized.

Basically, an applied multiple linear regression procedure was used to test the hypothesis that measures of impulsivity and/or impulse control interact with certain cognitive, personality, and sociometric variables

in explaining academic achievement.

In addition, regression equations were computed in order to test the contribution of the impulsivity measures to certain academic criteria while in the presence of other independent variables.

Results supported the idea that STEP Listening may be partially measuring impulse control, but the peer nomination item for impulse control seemed to be predominantly measuring a positive attitude toward others. The anticipated interactions between the supposed impulse control measures and various other personal characteristics did not materialize in any consistent way. There was no assurance at all that any given interaction effect would appear again in a cross-validation sample. Hence, there was little or no practical increase in the explanation of the criterion variance by the use of interaction or moderator variables in a multiple regression problem.

The suggestion was made that two personal characteristics are importantly related to self control; they are "intelligence" and the expectations of one's social environment. The recommendation was made to continue the study of the concept of impulse control in a clinical sense (individual case study) rather than on a group basis in which individual differences become lost.

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APPENDIX A

DESCRIPTION OF TEST INSTRUMENTS

GPA -- Grade point average derived from teacher evaluations of performance in content subjects (English, social studies, mathematics, science, foreign language) for each student during the school year for grade VII. The academic average for grades X, XI, and XII makes up the high school GPA.

CTMM Mental Functions -- Intelligence (IQ) measured by the California Test of Mental Maturity; different forms in grades VII and XII; ability to respond appropriately to language and non-language stimuli having to do with spatial relationships, logical reasoning, numerical reasoning, and verbal concepts.

STEP Listening -- Scores based upon responses to Sequential Tests of Educational Progress; comprehension of passages and questions read aloud; postulated to be a measure of cognitive apprehension, efficiency in attending to and concentrating upon verbal stimuli. (Adelson and Redmon, 1958)

Rhymes -- Scores derived from Guilford Factor Tests (GFT) responses; presumed to be a measure of an aspect of word fluency or verbal facility, listing words satisfying a specified requirement. (Guilford, 1959)

Consequences -- Scores derived from GFT responses; postulated to be a measure of an aspect of conceptual foresight, ability to go beyond what is given and extrapolate outcomes, and to be an element of originality. (Guilford, 1959; Wilson, Guilford, and Christensen, 1953)

Common Situations -- Scores derived from GFT responses; postulated to be a measure of an aspect of ideational fluency, ability to call up as many ideas or responses as possible in a given time. (Guilford, 1959)

Seeing Problems -- Scores derived from GFT responses; postulated to be a measure of an aspect of sensitivity to problems, awareness that problems exist. (Guilford, 1957)

Mutilated Words -- Scores derived from Kit of Reference Tests (KRT) responses; postulated to be a measure of an aspect of symbolic closure, or recognition of symbols. (Guilford, 1957)

Short Words -- Scores derived from KRT responses; postulated to measure speed of perceptual closure, or ability to cognize symbolic units. (Guilford, 1959)

Emotional Instability -- Scale values derived from JPQ responses; items such as "When people play a joke on you, do you usually enjoy it too, without feeling at all upset?"; combines two factors recognized among adults as main elements in neuroticism compared with self confidence and ego strength.

JPQ 8: Socialized Morale -- Scale values derived from Junior Personality Quiz; twelve items such as "When you have to write an essay about your thoughts on some subject do you (a) sometimes enjoy it, or (b) generally dislike having to do it?"; acceptance of school and cultural standards contrasted with dislike of learning and negative reaction to authority.

SSHA Scholastic Motivation -- Scale values derived from Survey of Study Habits and Attitudes (SSHA) responses; 55 items such as "Whether I like a subject or not, I still work hard to make a good grade" and "Unless I really like a subject, I believe in only doing enough to get a passing grade"; postulated to be a measure of academic attitude or motivational orientation towards scholastic achievement. (Brown, 1956, Brown, McGuire, and Holtzman, 1955)

CMAS Anxiety -- Scale values derived from Children's Manifest Anxiety Scale (CMAS); 41 items such as "I have trouble making up my mind," "My hands feel sweaty,"; postulated to be a measure of underlying anxiety, or "the motive to avoid failure," especially in ego-involving, threatening,

or stressful situations. (Casteneda, McCandless, and Palermo, 1956)

CYS Criticism of Education -- Scale values derived from Cooperative Youth Study (CYS) responses; ten items such as "Most teachers are too rigid and narrowminded" and "It is almost impossible for the average student to do all of his assigned homework"; postulated to be a measure of a set to be negative toward teachers and critical of what is expected in the school. (Moore and Holtzman, 1958)

CYS Personal Maladjustment -- Scale values derived from CYS responses; 21 items such as "Sometimes I feel things are not real," "I get mad and do things I shouldn't do when I can't have my way"; postulated to be a measure of inefficiency or borderline in contrast to the effective behavior of a mentally healthy individual--misperception of self and the object world, inability to cope with pressures imposed by others, lack of a sense of identity. (Moore and Holtzman, 1958)

ISS Family Status -- Index of social status derived from weighted values (McGuire and White, 1955) for occupation, source of income, and education of the status parent as reported on an identification blank and checked with informants; postulated to be an indicator of variations in learning experiences, in pressures and reinforcements from members of the family, and in expectations held for the boy or girl by school people.

Peer Nomination: Negative Behavior Model -- Name three persons you would not like to be like.

Peer Nomination: Academic Model -- Name three persons you could work with, or ask for help on a school problem.

Peer Nomination: Impulsive -- Name three persons about your age who do many things without thinking. They "don't care" but sometimes they are sorry.

Peer Nomination: Party With -- Name three persons about your age you would prefer to have along if you were going to a game or party this weekend. They are the ones to be with.

APPENDIX B

DESCRIPTIVE STATISTICS OF VARIABLES

	Community A Mean	S.D.	Community B Mean	S.D.	Community C Mean	S.D.	Community D Mean	S.D.
	N = 108		N = 97		N = 157		N = 203	
CTMM	103.03	10.59	99.66	13.49	101.58	14.04	104.02	13.33
STEP Listening	51.07	10.00	48.15	9.73	50.71	9.90	49.21	11.74
Seeing Probs.	23.32	7.40	21.51	8.82	22.47	8.69	21.68	7.54
Consequences	33.85	12.70	26.29	10.90	27.96	11.33	29.80	10.85
Common Sits.	33.80	8.18	27.08	8.72	32.98	9.29	28.85	8.46
Short Words	14.20	5.50	12.79	4.46	14.91	5.18	15.25	4.94
Rhymes	17.01	7.29	14.26	6.79	14.83	6.92	18.56	7.77
Mut'd. Words	19.39	6.00	19.42	5.66	17.87	5.36	19.27	5.14
CMAS: Anxiety	31.57	14.82	35.60	15.16	33.01	14.13	36.70	13.87
Pers. Maladj't.	13.68	7.02	13.29	6.65	12.99	6.52	14.26	5.88
Emot'l. Stabil.	3.81	1.87	4.24	2.08	4.15	2.14	4.15	2.12
Scho. Mot'n.	57.89	17.93	55.39	16.95	57.34	19.14	53.41	17.12
Soc'd. Morale	6.83	2.34	7.24	2.26	6.89	2.63	7.11	2.16
Crit. of Educ.	12.63	3.81	13.88	3.43	13.45	4.00	14.76	3.89
ISS	50.46	13.88	54.15	12.57	46.56	12.93	50.86	13.24
High Sch. GPA	78.93	7.23	77.61	8.06	76.85	8.93	76.16	10.00
Nom: Party With	5.54	1.99	5.25	1.72	5.08	1.81	5.03	1.78
Nom: Impulsive	5.28	1.51	4.76	1.05	4.61	1.00	4.83	1.23
Nom: Neg. Beh. Mod.	5.21	1.38	4.84	1.10	5.32	1.46	5.15	1.40
Nom: Acad. Model	5.98	1.75	5.27	1.45	5.73	1.52	5.28	1.27

MEANS AND STANDARD DEVIATIONS OF VARIABLES
USED IN ANALYSES WITH HIGH SCHOOL GPA AS THE CRITERION

	Community A Mean	S.D.	Community B Mean	S.D.	Community C Mean	S.D.	Community D Mean	S.D.
	N = 201		N = 178		N = 265		N = 412	
CTMM	97.76	13.32	97.04	13.97	99.91	14.54	99.34	14.00
STEP Listening	47.61	10.95	45.50	11.33	48.98	10.87	45.94	12.50
Seeing Probs.	20.83	8.51	20.01	9.07	21.94	8.85	20.31	8.72
Consequences	30.51	12.58	24.19	11.38	27.57	11.22	27.63	11.47
Common Sits.	31.70	8.99	26.86	9.06	32.03	9.96	28.27	9.08
Short Words	13.19	5.17	12.45	4.57	14.48	5.05	14.49	5.01
Rhymes	15.39	8.08	13.98	6.89	14.75	6.98	16.60	8.13
Mut'd Words	17.63	6.14	18.67	4.76	17.66	5.44	18.34	5.21
CMAS: Anxiety	35.83	16.89	37.87	15.51	34.59	14.83	38.93	14.54
Pers. Maladj't.	15.48	7.30	14.07	6.85	13.60	6.59	15.29	6.64
Emot'l. Stabil.	4.21	2.06	4.69	2.16	4.27	2.06	4.39	2.15
Scho. Mot'n.	54.24	18.79	53.44	18.49	55.41	19.32	50.14	17.16
Soc'd Morale	7.10	2.46	6.89	2.49	6.91	2.69	7.07	2.24
Crit. of Educ.	13.42	4.03	14.20	3.43	13.60	3.89	15.05	3.77
ISS	54.98	13.88	56.14	12.50	48.52	14.04	53.96	13.69
7th GPA	10.20	2.97	10.62	2.53	9.29	2.81	9.28	2.92
Nom: Party With	4.87	1.86	4.85	1.70	5.91	1.73	4.78	1.68
Nom: Impulsive	5.03	1,35	4.76	1.12	4.80	1.24	5.14	1.42
Nom: Neg. Beh. Mod.	5.09	1.35	4.90	1.16	5.39	1.52	5.34	1.41
Nom: Acad. Model	5.53	1.70	5.05	1.34	5.55	1.50	5.20	1.27

MEANS AND STANDARD DEVIATIONS OF VARIABLES
USED IN ANALYSES WITH 7th GRADE GPA AS CRITERION

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	CTMM	100	51	38	38	-19	02	-45	50	04	24	77	50	54	12	30	03	46	51	35	31	-14	05	-30	20
2	STEP Listen		100	34	27	-16	08	-36	45	08	28	93	70	74	40	59	50	75	31	33	25	-09	13	-21	25
3	Seeing Probs			100	30	-12	08	-31	36	-01	18	39	88	37	08	25	03	31	18	81	20	-11	07	-23	13
4	Mutilated Words				100	-03	07	-19	40	02	24	35	33	83	12	20	06	31	20	25	70	-01	08	-11	19
5	CMAS: Anxiety					100	-2	15	-19	-02	-12	-19	-16	-11	81	-27	00	-18	-11	-11	-03	83	-20	10	-11
6	Socialized Morale						100	-03	20	11	15	08	11	10	-17	83	04	15	11	14	-14	83	05	19	19
7	Index of Social Status							100	-27	-04	-16	-46	-40	-34	-06	-22	58	-33	-25	-28	-17	11	-05	68	-14
8	Seventh Grade GPA								100	16	44	53	46	52	08	40	14	54	37	38	40	-09	25	-06	42
9	Nom: Impulse Control									100	01	08	03	06	03	14	04	05	37	53	64	50	60	68	67
10	Nom: Academic Model										100	32	28	33	03	27	07	83	12	16	18	-10	14	-10	72
11	STEP Listening X CTMM											100	72	76	34	55	37	74	44	38	31	-12	12	-27	28
12	STEP Listening X Seeing Problems												100	61	24	46	23	58	27	74	26	-12	12	-26	22
13	STEP Listening X Mutilated Words													100	30	47	31	64	31	34	66	-06	13	-19	28
14	STEP Listening X CMAS: Anxiety														100	07	29	23	08	08	11	70	-11	-02	02
15	STEP Listening X Socialized Morale															100	29	62	26	30	25	-15	73	-06	30
16	STEP Listening X Index of Social Status																100	31	05	04	07	03	07	44	07
17	STEP Listening X Nom: Academic Model																	100	26	29	26	-13	16	-20	63
18	Nom: Impulse Control X CTMM																		100	63	70	36	54	43	68
19	Nom: Impulse Control X Seeing Problems																			100	52	18	40	16	47
20	Nom: Impulse Control X Mutilated Words																				100	30	44	33	57
21	Nom: Impulse Control X CMAS: Anxiety																					100	14	45	25
22	Nom: Impulse Control X Socialized Morale																						100	39	51
23	Nom: Impulse Control X Index of Social Status																							100	37
24	Nom: Impulse Control X Nom: Academic Model																								100

(NOTE: decimals omitted from correlation coefficients)

INTERCORRELATIONS USED IN BASIC MODEL AND MODERATED MODEL REGRESSIONS
(7th GRADE GPA CRITERION)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	CTMM	100	38	29	28	-12	00	-34	49	02	28	72	41	48	07	20	-03	41	47	25	29	-11	01	-24	21
2	STEP Listening		100	24	25	-12	01	-28	48	07	29	91	65	71	36	60	45	71	23	22	24	-08	12	-16	25
3	Seeing Problems			100	25	-02	12	-21	36	02	41	30	87	30	10	21	-01	26	15	80	18	-02	11	-14	16
4	Mutilated Words				100	-01	13	-16	37	00	28	36	32	85	11	23	04	33	17	19	74	-01	12	-11	20
5	CMAS: Anxiety					100	-24	13	-14	-00	-12	-14	-07	-07	86	-25	05	-15	-07	-03	-01	85	-19	10	-10
6	Socialized Morale						100	-03	16	08	12	08	14	15	-18	86	04	14	07	15	17	-17	1	04	16
7	Index of Social Status							100	-30	-05	-19	-36	-29	-26	00	-16	71	-28	-20	-19	-14	10	-05	72	-16
8	High School GPA								100	15	46	58	51	[illegible]	10	36	06	58	36	37	38	-06	22	-13	44
9	Nom: Impulse Control									100	00	05	04	04	02	10	01	03	88	57	64	48	59	64	65
10	Nom: Academic Model										100	35	30	37	02	24	02	86	12	16	20	-11	10	-14	73
11	STEP Listening X CTMM											100	66	74	30	51	32	72	38	27	30	-11	10	-23	29
12	STEP Listening X Seeing Problems												100	57	25	43	20	54	22	72	25	-05	14	-18	24
13	STEP Listening X Mutilated Words													100	26	47	26	63	25	26	65	-05	15	-16	29
14	STEP Listening X CMAS: Anxiety														100	02	28	19	05	08	09	74	-13	03	01
15	STEP Listening X Socialized Morale															100	26	46	18	23	26	-18	74	-05	26
16	STEP Listening X Index of Social Status																100	23	-01	00	05	05	05	55	03
17	STEP Listening X Nom: Academic Model																	100	21	22	27	-13	13	-18	66
18	Nom: Impulse Control X CTMM																		100	61	70	36	52	44	67
19	Nom: Impulse Control X Seeing Problems																			100	50	25	42	23	49
20	Nom: Impulse Control X Mutilated Words																				100	30	48	33	58
21	Nom: Impulse Control X CMAS: Anxiety																					100	10	41	22
22	Nom: Impulse Control X Socialized Morale																						100	36	47
23	Nom: Impulse Control X Index of Social Status																							100	31
24	Nom: Impulse Control X Nom: Academic Model																								100

(Note: decimals omitted from correlation coefficients)

INTERCORRELATIONS USED IN BASIC MODEL AND MODERATED MODEL REGRESSIONS
(HIGH SCHOOL GPA CRITERION)

APPENDIX C

TABLES OF SEPARATE

COMMUNITY ANALYSES FOR INTERACTION

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, and Cross Product	(R_r) Nom: I-C, and Variable	F
CTMM	.6938	.6906	.905	.4720	.4711	.120
Seeing Problems	.6660	.6660	.000	.2599	.2417	1.026
Consequences	.6526	.6520	.151	.2915	.2674	1.546
Common Situations	.6596	.6571	.605	.2216	.2129	.415
Short Words	.7180	.7118	1.909	.4577	.4534	.514
Rhymes	.7005	.6965	1.142	.5543	.5491	.885
Mutilated Words	.7087	.6928	4.717*	.4735	.4618	1.484
CMAS: Anxiety	.6532	.6526	.137	.2526	.1312	5.224*
Personal Maladjustment	.6533	.6527	.140	.2538	.1620	4.286*
Emotional Instability	.6745	.6745	.000	.2717	.2624	.563
Scholastic Motivation	.6706	.6632	1.887	.3552	.3549	.023
Socialized Morale	.6560	.6551	.237	.1791	.1744	.182
Criticism of Education	.6534	.6532	.029	.1561	.1341	.688
Index of Social Status	.4758	.4710	.903	.1789	.1754	.429
Nom: Party With	.6899	.6881	.492	.3425	.3128	2.315
Nom: Neg. Beh. Model	.6597	.6532	1.578	.1612	.1496	.390
Nom: Academic Model	.7838	.7800	1.593	.6529	.6504	.590

** = p < .01
* = p < .05

Table C-1: F-tests for significance of interaction with high school GPA as criterion (Community A; N = 108)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C, and Variable	F
CTMM	.5781	.5772	.149	.4845	.4828	.204
Seeing Problems	.6322	.6248	1.454	.5253	.5186	.902
Consequences	.5627	.5620	.115	.3672	.3648	.189
Common Situations	.6131	.6129	.040	.5238	.5215	.309
Short Words	.6305	.6304	.014	.4643	.4558	.937
Rhymes	.6084	.6083	.005	.5039	.4978	.767
Mutilated Words	.6507	.6490	.361	.4913	.4650	3.119
CMAS: Anxiety	.5734	.5734	.010	.3867	.3778	.750
Personal Maladjustment	.5744	.5731	.214	.3371	.3344	.193
Emotional Instability	.5550	.5549	.011	.3405	.3384	.151
Scholastic Motivation	.5960	.5958	.032	.4976	.4631	4.151*
Socialized Morale	.5684	.5591	1.457	.3211	.3204	.053
Criticism of Education	.5868	.5726	2.352	.3720	.3716	.030
Index of Social Status	.3461	.3409	.672	.1599	.1586	.132
Nom: Party With	.5731	.5588	2.267	.3744	.3642	.820
Nom: Neg. Beh. Model	.5654	.5600	.843	.3174	.3004	1.101
Nom: Academic Model	.5923	.5868	.931	.4359	.4322	.371

** = p<.01
* = p<.05

Table C-2: F-tests for significance of interaction with high school GPA as criterion (Community B; N = 97)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C, and Variable	F
CTMM	.7110	.6908	8.808**	.6128	.6125	.094
Seeing Problems	.6761	.6721	1.538	.4736	.4719	.327
Consequences	.6356	.6334	.709	.3904	.3832	1.014
Common Situations	.6297	.6265	1.025	.3139	.3131	.087
Short Words	.6544	.6532	.400	.4428	.4412	.281
Rhymes	.6792	.6781	.456	.5624	.5600	.589
Mutilated Words	.6838	.6600	9.245**	.4738	.4700	.716
CMAS: Anxiety	.6492	.6368	4.247*	.3696	.3688	.106
Personal Maladjustment	.6339	.6279	1.952	.3176	.3175	.008
Emotional Instability	.6414	.6376	1.266	.4016	.4016	.000
Scholastic Motivation	.6466	.6447	.663	.4601	.4600	.011
Socialized Morale	.6319	.6274	1.475	.3045	.3045	.000
Criticism of Education	.6250	.6230	.633	.3381	.3358	.272
Index of Social Status	.4185	.4141	1.103	.1887	.1874	.237
Nom: Party With	.6213	.6213	.000	.3415	.3413	.031
Nom: Neg. Beh. Model	.6241	.6239	.081	.2848	.2817	.296
Nom: Academic Model	.7116	.7058	2.579	.6315	.6218	3.118

** = $p < .01$
* = $p < .05$

Table C-3: F-tests for significance of interaction with high school GPA as criterion (Community C; N = 157)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.5732	.5714	.613	.5526	.5518	.264
Seeing Problems	.4390	.4384	.133	.3702	.3669	.566
Consequences	.3974	.3966	.162	.2973	.2891	1.056
Common Situations	.3435	.3423	.188	.1909	.1758	1.150
Short Words	.4608	.4602	.151	.3947	.3912	.646
Rhymes	.5223	.5220	.083	.4994	.4970	.652
Mutilated Words	.4221	.4190	.646	.3488	.3410	1.228
CMAS: Anxiety	.3379	.3320	.899	.1454	.1211	1.320
Personal Maladjustment	.3386	.3307	1.200	.1248	.1026	1.025
Emotional Instability	.3662	.3567	1.585	.2263	.2216	.444
Scholastic Motivation	.4932	.4913	.480	.4373	.4244	2.751
Socialized Morale	.3641	.3630	.185	.2173	.2076	.865
Criticism of Education	.4374	.4338	.751	.3515	.3471	.706
Index of Social Status	.1389	.1383	.103	.0825	.0802	.432
Nom: Party With	.3751	.3741	.184	.2644	.2630	.151
Nom: Neg. Beh. Model	.3581	.3377	3.249	.1670	.1478	1.242
Nom: Academic Model	.4359	.4358	.024	.3379	.3333	.706

** = $p < .01$
* = $p < .05$

Table C-4: F-tests for significance of interaction with high school GPA as criterion (Community D; N = 203)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.7701	.7701	.021	.6092	.6031	2.355
Seeing Problems	.6829	.6761	3.430	.4211	.4014	3.908*
Consequences	.6519	.6490	1.282	.3449	.3194	3.801
Common Situations	.6551	.6515	1.611	.3362	.2821	7.476*
Short Words	.6987	.6981	.348	.4742	.4441	7.060**
Rhymes	.7153	.7134	1.157	.6274	.6050	9.024**
Mutilated Words	.7122	.7112	.567	.6000	.5676	11.704**
CMAS: Anxiety	.6686	.6654	1.540	.3193	.2910	3.811
Personal Maladjustment	.6620	.6605	.705	.3276	.2493	10.015**
Emotional Instability	.6806	.6801	.223	.3770	.3572	3.361
Scholastic Motivation	.6960	.6941	1.012	.5507	.5431	2.373
Socialized Morale	.6579	.6579	.000	.2448	.2384	.656
Criticism of Education	.6651	.6586	3.058	.3064	.3051	.168
Index of Social Status	.6565	.6537	1.192	.3345	.3345	.002
Nom: Party With	.6854	.6829	1.254	.4146	.3628	9.623**
Nom: Neg. Beh. Model	.6611	.6515	4.423*	.2092	.1859	1.906
Nom: Academic Model	.7394	.7307	5.563*	.5862	.5761	3.516

** = $p < .01$
* = $p < .05$

Table C-5: F-tests for significance of interaction with seventh grade GPA as criterion (Community A; N = 201)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.5789	.5682	3.225	.4989	.4984	.119
Seeing Problems	.5818	.5818	.017	.4610	.4500	2.224
Consequences	.5394	.5390	.086	.3261	.3226	.449
Common Situations	.5846	.5833	.411	.4332	.4257	1.403
Short Words	.5573	.5569	.117	.2959	.2778	1.994
Rhymes	.5963	.5875	2.823	.4768	.4736	.690
Mutilated Words	.6019	.6018	.023	.3519	.3512	.104
CMAS: Anxiety	.5408	.5406	.052	.2430	.2430	.000
Personal Maladjustment	.5387	.5359	.739	.1925	.1924	.010
Emotional Instability	.5650	.5551	2.849	.3467	.3467	.000
Scholastic Motivation	.5932	.5888	1.406	.4728	.4467	5.403*
Socialized Morale	.5470	.5453	.453	.3384	.2589	9.383**
Criticism of Education	.5410	.5398	.312	.2483	.2483	.000
Index of Social Status	.5523	.5496	.658	.3248	.3230	.208
Nom: Party With	.5493	.5470	.636	.3028	.2991	.425
Nom: Neg. Beh. Model	.5507	.5443	1.747	.1591	.1591	.000
Nom: Academic Model	.5839	.5793	1.402	.3699	.3698	.002

** = $p < .01$
* = $p < .05$

Table C-6: F-tests for significance of interaction with seventh grade GPA as criterion (Community B; N = 178)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.5531	.5274	10.492**	.5032	.5019	.466
Seeing Problems	.5151	.5120	1.120	.4271	.4208	1.707
Consequences	.4863	.4860	.091	.3787	.3497	6.460*
Common Situations	.4637	.4592	1.390	.2677	.2605	1.068
Short Words	.5525	.5510	.601	.4503	.4502	.028
Rhymes	.5831	.5689	6.484*	.5302	.5289	.499
Mutilated Words	.5014	.5010	.162	.3790	.3701	2.022
CMAS: Anxiety	.5113	.5109	.155	.3574	.3566	.191
Personal Maladjustment	.5122	.5122	.000	.3392	.3356	.720
Emotional Instability	.5986	.5973	.628	.5260	.5207	1.993
Scholastic Motivation	.6334	.6327	.381	.5767	.5766	.036
Socialized Morale	.5426	.5358	2.737	.3468	.3468	.000
Criticism of Education	.5228	.5228	.000	.4032	.3951	2.025
Index of Social Status	.4840	.4645	5.980*	.3363	.3302	1.134
Nom: Party With	.5471	.5216	10.213**	.3863	.3775	2.066
Nom: Neg. Beh. Model	.4946	.4919	.954	.2811	.2615	3.022
Nom: Academic Model	.6471	.6466	.291	.6356	.6303	2.973

** = $p < .01$
* = $p < .05$

Table C-7: F-Tests for significance of interaction with seventh grade GPA as criterion (Community C; N = 265)

MULTIPLE R MODEL VARIABLE	(R_f) STEP L, Variable, & Cross Product	(R_r) STEP L and Variable	F	(R_f) Nom: I-C, Variable, & Cross Product	(R_r) Nom: I-C and Variable	F
CTMM	.5664	.5653	.748	.5673	.5663	.650
Seeing Problems	.4850	.4802	2.465	.4914	.4719	10.132**
Consequences	.4687	.4624	3.087	.4374	.4330	1.928
Common Situations	.4842	.4783	3.049	.4403	.4399	.192
Short Words	.4891	.4856	1.847	.4598	.4590	.377
Rhymes	.5502	.5502	.010	.5599	.5566	2.198
Mutilated Words	.5008	.5001	.391	.4598	.4586	.541
CMAS: Anxiety	.4103	.4045	2.330	.3241	.3143	2.8[illegible]
Personal Maladjustment	.4314	.4180	5.712*	.3220	.3199	.6[illegible]
Emotional Instability	.4219	.4210	.372	.3587	.3474	3.737
Scholastic Motivation	.5333	.5332	.059	.4891	.4865	1.352
Socialized Morale	.4110	.4016	3.746	.2873	.2796	1.947
Criticism of Education	.4385	.4364	.948	.3640	.3604	1.239
Index of Social Status	.4513	.4508	.185	.4384	.4370	.472
Nom: Party With	.4929	.4802	6.710**	.4355	.4331	1.053
Nom: Neg. Beh. Model	.4329	.4321	.362	.2901	.2877	.614
Nom: Academic Model	.4955	.4955	.009	.4304	.4303	.031

** = $p < .01$
* = $p < .05$

Table C-8: F-tests for significance of interaction with seventh grade GPA as criterion (Community D; N = 412)